FEMP-Baseline Inspection, 1997

Inspection Under the National Emission Standards for Emissions of Radionuclides Other Than Radon From Department of Energy Facilities 40 CFR 61, Subpart H

I. FACILITY IDENTIFICATION

A. Facility Location Fernald Environmental Management Project
7400 Willey Road
Fernald, Ohio 45030 (Site Location)

Fernald Environmental Management Project
United States Department of Energy
Fernald Field Office (FN)
Post Office Box 538705, Mail Stop 45
Cincinnati, Ohio 45253-8705 (Mailing Address)

B. Responsible Official

Jack R. Craig, Director
United States Department of Energy
Ohio Field Office, Fernald Area Office

II. DATE OF INSPECTION

July 21 through 25, 1997

III. PARTICIPANTS

A. Facility

Kathleen Nickel, USDOE; Ed Skintik, USDOE; Mark Cherry, FDF; Kevin Tschaen, FDF; Kip Klee, FDF; Phil Spots, FDF; Debbie Reichard, FDF; Tim Miller, FDF, Sue Olensky, FDF; John Byrne, FDF; Larry Tomzack, FDF; Lewis C. Goidell, FDF

B. USEPA

Michael H. Murphy, Lead Inspector, USEPA; Jeanette Marrero, USEPA; Charles Phillips, SC&A, Contractor for USEPA

C. State of Ohio

James Colelli, ODH/BRP; William Lohner, OEPA/OFFO; Peter Sturdevant, Hamilton County Department of Environmental Services; Dana Thompson, OEPA/CDO

IV. ACRONYMS AND ABBREVIATIONS USED IN THIS REPORT

AMS Air Monitoring Station ANSI American National Standards Institute

APC	Air Pollution Control
BE	Building exhaust
BRP	Bureau of Radiation Protection
C	Celsius
CDO	Central District Office
CERCLA	Comprehensive Environmental Restoration, Compensation, and Liabilities Act
CFR	Code of Federal Regulations
cpm	Counts per minute
DAPC	Dayton Air Pollution Control or Division of Air Pollution Control
DMR	Discharge Monitoring Report
DOE	Department of Energy (United States)
DQO	Data Quality Objective
EDE	Effective Dose Equivalent
EML	Environmental Measurements Laboratory
EMSL-LV	Environmental Monitoring Systems Laboratory at Las Vegas
F	Fahrenheit
FDF	Flour Daniel Fernald
FEMP	Fernald Environmental Management Project
FFA	Federal Facility Agreement
FFCA	Federal Facility Compliance Agreement
FMPC	Feed Materials Production Center
FOV	Finding of Violation

g	Grams
Ge(Li)	Germanium Lithium detection probe
IEMP	Integrated Environmental Management Plan
KeV	Kilo electron volts (1000 electron volts)
µm	Micrometer, Micron (0.000001 meter)
MDL	Minimum detection Limit
N/A	Not Applicable or Not Available
NAREL	National Air and Radiation Environmental Laboratory
NESHAP	National Emission Standard for Hazardous Air Pollutants
NOAA	National Oceanographic and Atmospheric Administration
ODH	Ohio Department of Health
OEPA	Ohio Environmental Protection Agency
OFFO	Office of Federal Facility Oversight
QA	Quality Assurance
QAPjP	Quality Assurance Project Plan
QC	Quality Control
RMP	Radon Measurement Program
SC&A	Sanford Cohen and Associates
SOPs	Standard Operating Procedures
SOW	Scope of Work
U-235	Uranium-235
USDOE	United States Department of Energy
USEPA	United States Environmental Protection Agency

V. OBJECTIVE/SCOPE OF INSPECTION

The objective of this inspection is to provide a baseline evaluation by the USEPA for compliance with the radionuclide NESHAP, 40 CFR 61, Subpart H. The inspection is intended to ascertain whether the Fernald Environmental Management Project is meeting the requirement of the rule and conditions are as represented in the latest annual report. An evaluation of the current status of the FFA on 40 CFR 61, Subpart Q will also be assessed to verify any changes that may be necessary to better reflect the actual site conditions at this time. The Findings of this Inspection will determine the necessity of issuing Findings of Violations (FOVs) and negotiating a Federal Facility Compliance Agreement (FFCA). This inspection will cover as many areas as possible and in as great a detail and depth as possible in the given time for the baseline inspection. The scope of the inspection is to 1) perform a walk-through survey to observe all of the locations that are, have been, or are currently suspected of being emission points on site to determine compliance with the monitoring requirements of the regulation, 2) review the proposed sites for an alternate air monitoring program that has been requested for approval, and 3) examine documents on dose modeling and compliance with other record keeping requirements of the rule.

VI. FACILITY DESCRIPTION

The following description is taken from the 1996 National Emissions Standards for Hazardous Air Pollutants, Subpart H Annual Report dated June 24, 1997. The Fernald Environmental Management Project (FEMP) is located on a 425 hectare (1050 acre) area approximately 27 km (17 miles) northwest of Cincinnati, Ohio. The Production area covers approximately 136 acres (55 hectares) in the center of the FEMP. The facility is sited just north of the small farming community of Fernald, Ohio.

The area immediately surrounding the FEMP is primarily rural in nature, characterized by the predominance of agriculture, with some light industry and private residences. The FEMP is located on a relatively level plain, outside of the 500-year flood plain of the Great Miami River, in an ancestral river valley known as the New Haven Trough.

The climate is characterized as continental, with average temperatures ranging from approximately 29º F (-1.7º C) in January, to 76º F (24.4º C) in July. Average annual precipitation is approximately 40 inches (102 cm) per year. Prevailing wind flow is from the south-southwest.

For 37 years, the former Feed Materials Production Center (Fernald Site) produced uranium metals for the United States Department of Energy (DOE) and its predessors. On July 10, 1989, uranium metals production was suspended. Management responsibilities of the Fernald site were transferred from the Defense Programs organization to DOE's Office of Environmental Restoration and Waste Management.

Currently, most activities at the FEMP are conducted under the Comprehensive Environmental Response, Compensation, and Liabilities Act (CERCLA). These activities include sample analysis, waste characterization, the management, treatment, storage, and disposal of hazardous,

mixed, low-level and solid wastes, and the decontamination and cleanup of radioactively contaminated buildings, equipment, soils, and waters. The site also manages thorium wastes, and K-65 silo waste material which contains radium and produces radon gas.

VII. INSPECTION FINDINGS

The following findings were observed actions, documentations, or lacks of actions and/or documentations during the baseline inspection of the FEMP conducted July 21 through 25, 1997. These observations were provided by USEPA, SC&A, contractor to USEPA, ODH/BRP, and various OEPA offices. Each of these findings needs to be addressed by either comment or action. Some of these items were mentioned during the close out meeting and it was indicated that these issues would be addressed in an expedited time frame. Some of these items are addressed under the Integrated Environmental Management Plan (IEMP), which has been conditionally approved by USEPA and implementation of this agreement is in process.

GENERAL FINDINGS

1) While the real-time data collection from the radon monitors is impressive, efforts should be directed at measuring net radon concentration as low as possible at the FEMP fenceline. This practice is referenced in the FFA on radon emissions from the K-65 silos and the FEMP indicates that radon emissions should be mitigated to 0.015 pCi/L above background at the nearest resident. Although this radon concentration is not measurable with available technology, effects should be directed at measuring concentrations at the FEMP fence line as low as possible.(OFFO)

2) Instrument background should be subtracted from gross counts when measuring radon concentrations, as well as, tracking meteorological data with radon concentrations to indicate when certain sampling locations are being affected from releases from the silos. (OFFO)

3) The routine uranium and thorium analyses for the stack and environmental particulate samples are performed at the FEMP at internally managed laboratories while the quarterly, more extensive analyses, are performed at commercial laboratories under contract to Fluor Daniel. The contract laboratories were selected through a competitive process and perform according to the statement of work (SOW) in their contract.(USEPA)

4) Data and supporting documentation from both the internal and contract laboratories were reviewed. The data review was intended to provide an assessment of the quality and sufficiency of the analysis performed on NESHAPS compliance samples. In addition, since FEMP has requested to use ambient monitoring data in lieu of stack sampling, the ambient monitoring data currently being generated were included. Three criteria were evaluated in the laboratory review: A) Laboratories conforming to written SOPs, procedures, and plans; B) Data independently verifiable (reproduced) from the documents accompanying the data or conveniently and in a comprehensive package; and C) Analytical process in control, as evidenced by the results of quality control samples analyzed concurrently with the samples.(USEPA)

5) The requirements of the SOW associated with the procurement of contract laboratory services is consistent with procurements for DOE programs. If the contract laboratories selected conform to these requirements, the data packages submitted by these laboratories can be used to demonstrate the compliance with the laboratory selection criteria. A review of two comprehensive data packages prepared by one of the contract laboratories indicated that, in general, that laboratory was compliant with the contract requirements relative to the contents of the data packages. However, there was no evidence to indicate that the data packages received by Flour Daniel from the contract laboratory were subjected to a verification process to confirm contract compliance.(USEPA)

6) A review of the training records of the primary analysts for uranium and thorium, indicated that their training and certifications were compliant with the requirements of the Quality Assurance Plan.(USEPA)

7) The laboratory Quality Assurance Plan, which was only cursorily reviewed, lacked the degree of specificity usually found in such documents. For example, the frequency of QC samples is not specified in the Plan.(USEPA)

8) Laboratory instrument calibrations appear to have been performed adequately and timely. Standard preparations are well documented and traceable. (USEPA)

9) A review of the results of the internal QC samples and the external PE (performance evaluation) samples indicates that the laboratory is performing well. (USEPA)

10) After the accumulation of documentation from several sources, It was possible to independently verify some data from the stack sampling analyses. However, some of the requested data could not be produced within the time frame of the audit.(USEPA)

11) Thorium work cards documenting laboratory tracking often had no "sign-off" on data entry or review and one uranium work card had no signed approval.(USEPA)

12) The corrective action file for the laboratory seemed complete and the actions documented. However, the follow-up to situations creating the necessity of a corrective action was lacking. Most corrective actions tried to explain away the necessity of any action as opposed to looking into the reason for a failure. (USEPA)

13) Internal audits of the laboratory were performed and documented.(USEPA)

SPECIFIC FINDINGS

1) While observing a high volume air sample filter change out at AMS#5 the technician did not use gloves to change out the filter nor to replace the filter. While the procedures do not specifically mention donning gloves, it is good sampling protocol to wear gloves to exchange filters. One pair should be worn to remove the soiled filter, and a clean pair should be used to place the new filter. This practice should help prevent cross contamination of filters. These

criteria can be found is EPA/600/R-94/038b, April 1994, Quality Assurance Handbook for Air Pollution Measurement Systems, Volume II, Ambient Air Specific Methods (Interim Edition) Section 2.2.4, Sampling Procedure. "Care must be taken to assure that the clean weighed filters are not damaged or soiled prior to installation in the high-volume sampler." The donning of gloves is a method to prevent the soiling of clean filters.(OFFO)

2) A site of a proposed ambient air monitoring location will require trees and brush to be removed from the proposed site before monitoring begins to meet the siting requirements for the air monitors. (Specifically AMS#22). All siting criteria for ambient air monitors must be followed for acceptable data to be produced. The siting criteria can be found at 40 CFR 58, Appendix E.(OFFO, USEPA)

3) The height of the alpha track-etch cups and continuous radon monitors should be placed in the breathing zone. A good sampling practice would be to locate all samplers at the same height. This recommended practice can be found in the Radon Measurement Operators Proficiency , Course Manual, Unit 3, Radon Measurement. (OFFO)

4) The calibration stickers for the air flow monitors on the laboratory stack were out of date.(OFFO)

5) Current recordkeeping methods appear to be insufficient to allow independent verification of the analytical process on in house analyses. Flour Daniel Fernald, Environmental Monitoring Project Procedure, Procedure Development and Training, ADM-01, (July 1997) Section 6.2[2]; states "Ensure procedures are reviewed yearly for changes."(OFFO, USEPA)

6) Records should be available, on-site, as required under 40 CFR 61.95. Flour Daniel Fernald, Environmental Monitoring Project Procedure, Procedure Development and Training, ADM-01, (July 1997) Section 6.2[2]; states "Ensure procedures are reviewed yearly for changes."(OFFO, USEPA)

7) The High Volume Air Monitoring Procedure (PROC. NO. SRS-REM-001) appears to be out of date. The documentation employed by the field sampling technician did not match the documentation requirements listed in this procedure.(OFFO)

8) The Real-Time Environmental Monitoring Procedure EM-RM-014 is out of date. This procedure is dated 6/16/92. FEMP procedures are required to be reviewed every two years. (If this procedure has been reviewed, there was no documentation provided to indicate a review date.) (OFFO)

9) There is little documentation provided with the alpha track-etch radon monitors to indicate data manipulation from vendor to concentrations reported in the ASER. This may impact the data validity. The QA/QC for all data manipulation needs to be provided in a verifiable and documented form or a regular basis. This requirement can be found in 40 CFR 61, Appendix B, Method 114.(OFFO, USEPA)

10) The Environmental Radon Monitoring procedure (PROC NO: EP-REM-011) is not consistent with actual field sampling practices. The procedure indicates the use of type "L" and type "M" cups while "radon only" cups are being used. Also, blind blank (unexposed) cups should be sent to the vendor as a QC on the measuring laboratory. This procedure, to incorporate QA/QC cross-checks, may be found in the Radon Measurement Operators Proficiency , Course Manual, Unit 3, Radon Measurement. (OFFO)

11) The RMP listing for the radon vendor appeared to be out-of-date.(OFFO)

12) The desiccant tower and filter of the silos continuous radon monitoring system need to be changed with an appropriate frequency and documented in a procedure. (As observed, the desiccant tower required changing.) (OFFO, USEPA)

13) The USEPA Region 5 radiation program, requires a 95 percent recovery rate for all data used for compliance under the radionuclide NESHAPs, including meteorological data. The meteorological tower equipment needs to be in sufficient replicate to assure that this is met. Typically three separate sets of equipment for each of the sampling points on the tower is considered adequate. One set currently installed, one set that may be out for calibrations, and a third set as an emergency backup for unforseen circumstances that can readily occur during the time of thunderstorms or other adverse weather conditions.(USEPA)

14) The Advanced Waste Water Treatment (AWWT) facility has been identified as a source of radionuclide emissions. However, no mention of the AWWT is made in the annual report for 1996. The status of the AWWT, therefore, remains unclear.(Hamilton Co.)

15) An application for the renewal of the State Permit to Operate (PTO) has been submitted to this Department for the Laundry Facilities located in Building 11. This application contains a request that the requirement for monitoring of the stack be deleted. Although the calculated Potential to Emit (PTE) does not require monitoring of this source under 40 CFR 61.93, the stack monitoring requirements of the PTO remain in effect until a determination to the contrary is made.(Hamilton Co.)

16) There is a lack of comprehensive documentation upon which to independently verify the analytical data produced by the internal laboratory for stack analyses. No data package, as such, exists which documents the analytical analysis process and the QC samples appropriate to it. While the data seem to be available in several different locations it is never assembled into a single package. Thus, much effort it required for an auditor to evaluate the analytical results. Outlined below is an example of a minimum data package that should be produced. (USEPA)

Sample Cross Reference:

It was difficult to track samples due to various numbers assigned. A table providing this at the beginning would help.

Case Narrative:

No case narrative is currently developed to cover both the uranium and thorium analyses. So it is not possible to determine if problems were encountered during the analyses.

Sample Data Report:

The results of all analysis for a single sample should be on one sheet.

QC Summary:

The results of all QC samples processed should be summarized.

Standards and Calibration:

Standards and tracers should be identified along with the documentation of dilutions and copies of certificates. Instrumentation calibrations should be documented.

Sample Preparation Summary:

Sample preparation logs; including weights, dilutions, and sample analysis fractions; should be presented.

Raw Data:

Enough raw analysis data should be included to verify the results

17) It does not appear that the analytical data documentation developed for NESHAPS compliance samples currently meets the record keeping requirements of the rule.

VIII. CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are made based upon the review of the documentation and the actual viewing of procedures during the July 21 through 25, 1997, inspection of this facility, the information previously submitted in the annual report required under 40 CFR 61, Subpart H, and the submitted Application for and Alternate Methodology for Compliance Demonstration. 1. The FEMP Laboratory should develop a data package along the lines outlined in Specific Comment number 17, above for the data produced in determining compliance with the NESHAPS rule. Otherwise all of the data produced by the on-site evaluators is suspect, as the QA requirements found in 40 CFR 61, Appendix B, Method 114 are not met.

2. The Quality Assurance Plan for the internal laboratories should be reviewed and written with more specificity relative to the work performed in the laboratory.

3. The Alternate Methodology was approved as submitted on August 11, 1997, and will be reviewed as necessary to assure the facility is appropriately demonstrating compliance with 40 CFR 61, Subpart H.

4. Regarding the meteorological tower, it is strongly recommended that three sets of instruments for each sampling height be available. As provided in the report above, one set installed, one set as a backup, and the third set being calibrated for use. Regardless of the perceived needs or lack of needs of the facility, this type of data is required for a variety of compliance issues and needs to be addressed in a timely manner.

5. All SOP's or alternate procedures need to be adequately documented and updated. A procedure for regular review of these procedures needs to be developed to assure that this is completed in a timely manner on a regular basis, or in the case of changes necessary in the interim, notations need to be made indicating that a procedure change has been requested and is in the process of review or change as specified under an appropriate QA/QC procedure.

6. All changes in documentation need to be signed and/or initialed as appropriate, and dated. If interim approval has been given to change a procedure, this should be clearly noted and be included with the current procedure until such time as the new procedure can be fully reviewed and approved.